REMARKS

Responsive to the outstanding Office Action, applicant has carefully studied the Examiner's rejections. Favorable reconsideration of the application in light of the following arguments is respectfully requested.

Claims 1-9 are pending in the application. In the response claims 1-2, 4-5, 7 and 9 have been amended. It is respectfully submitted that no new matter was added in making these changes.

REJECTIONS UNDER 35 USC §112

In the Office Action, the Examiner rejects claims 1-9 under USC §112 for indefiniteness. In response thereto, claims 1 has been rewritten to herein in a manner believed to be more definite. Specifically, the fiber geometry has been rewritten to more clearly state the "fiber orientation and the geometry" which is believed to be a clearer expression. In step b) of claim 1, it is noted that the textile starting materials are laid two-dimensionally in a aplane to manufacture a two dimensional bonded fabric. As noted in paragraph [0007] of the description, a fixing can take place before during or after step c) of claim 1. It is therefore not required to bond the textile material after it is lad to manufacture a two-dimensional bonded fabric. It is therefore believed that a bonding step is not required at this point. Therefore the term bonded has been removed. Fixing means has been clarified to indicate "fixing means for fixing the textile starting material. Shaping/draping has been clarified as "at least one of shaping and draping".

In view of the above, reconsideration and withdrawal of this rejection are respectfully requested.

REJECTIONS UNDER 35 USC 102

Claims 1-4 and 7-9 were rejected under 35 USC 102 as being anticipated by Taggart. The Examiner stated that Taggert teaches a method for producing a three dimensional preform having a final target shape from textile starting materials wherein 2 dimensional bonded fabric is formed by laying textile materials two dimensionally to form a stack which is subsequently subjected to heated rollers in order to bond the stack together into a two-dimensionally bonded fabric. The subsequent bonded fabric is subjected to shaping or draping to form the bonded three dimensional target shape.

Claim 1 defines a method for the production of a three-dimensional preform having a final three dimensional target shape from textile starting materials such as fibers, fiber bundles or tapes. The fiber orientation and the geometry in a two-dimensional fabric is determined by back-calculation from the final thee-dimensional target shape. The textile starting materials are laid two-dimensionally in a plane to manufacture a two-dimensional fabric, whereby the textile starting materials are laid such that the orientation of the fibers of the textile starting material and the geometry of the two-dimensional fabric are as back-calculated from the three-dimensional target shape. The final three-dimensional target shape is produced by shaping/draping of the two-dimensional fabric.

Thus, the present invention, as defined in independent claim 1, defines a method for producing a three dimensional preform, wherein complex three-dimensional geometries, an optimal fiber orientation and a high deposit rate can be achieved.

The present invention, as defined in claim 1, includes the steps of:

a) determining the fiber orientation and the geometry in a two-dimensional bonded fabric by back-calculation from the final three-dimensional target shape,

b) laying out the textile starting material to manufacture a two-dimensional fabric such that in the two-dimensional fabric the orientation of the fibers in the two-dimensional fabric are as back-calculated from the three-dimensional target shape, and

c) producing the three-dimensional target shape by at least one of shaping or draping the two-dimensional fabric.

With regard to the prior art, Taggart et al. describe a process for manufacturing advanced composite structures. Taggart teaches that in a first step a laminate is made including different plies, in each of which the fibers are unidirectional. After a step of cutting the laminate, the laminate is heated and molded using a stamping press.

From a comparison of the present invention and the disclosure of Taggart et al. it is obvious to one skilled in the art that a single ply is to be understood as two-dimensional fabric and not a laminate, which has a non-negligible thickness. Therefore, even though all steps are executed automatically, Taggart et al. do not disclose or imply that the fiber orientation within the plies is back-calculated from the final three-dimensional target shape. It is therefore submitted that the present application according to claim 1 differs from the disclosure of Taggart et al. in that the fiber orientation in the two-dimensional fabric is back calculated from said final three-

dimensional target shape. In view of the above, present claim 1 is submitted to be distinguishable over the disclosure of Taggart et al.

In view of the above, it is respectfully submitted that claim 1 is not anticipated by the Evans reference. Claims 2-3, and claims 4-9, depend from claim 1 and are believed to be allowable based, at least, on this dependence.

REJECTIONS UNDER 35 USC 102/103

Claims 5 and 6 were rejected under 35 USC 103 as being unpatentable over Taggert as described above.

Claims 5 and 6 depend directly or indirectly from what is believed to be an allowable claim 1, as described above, and are therefore believed to be allowable based, at least, on this dependence.

Claims 1-9 were rejected under 35 USC 103 as being unpatentable over Taggert and further in view of either one of Wang or Williamson and further in view of any of Cogburn, Cavallaro and Marshall.

Wang et al. disclose a computerized ply pattern generation method according to which a three-dimensional solid model is divided into a plurality of shells having a thickness according to a ply. Said shells are mapped to two-dimensional unfolded surfaces in order to achieve the geometry of the plies.

However, Wang et al. do not mention how the plies are configured and do not give any hint on the <u>orientation</u> of the fibers in the two dimensional fabric.

Therefore, if a person skilled in the art combines the disclosure of Taggart et al. with that of Wang et al., he would arrive at a method, according to which the geometry

of the two-dimensional fabric is determined as proposed by Wang et al. However he does not arrive at the feature of back-calculating the fiber orientation from a final three-dimensional target shape, as was discussed above with regard to the rejections under 35 USC 102.

Similarly, Williamson et al. describe a method for generating a two-dimensional form from a surface of a three-dimensional component. Using said two-dimensional form, a three-dimensional component can be formed.

As already discussed above with respect to Wang et al., the disclosure of Williamson et al. describes the back-calculation of the form of the two-dimensional compound from the three-dimensional shape. However, there is again no hint on a back-calculation of the orientation of <u>fibers</u> within the two-dimensional compound. Therefore, the feature of back-calculating the fiber orientation is not obvious from the disclosure of Williamson et al.

Cogburn et al. describe a method for producing filament rein forced structural shapes. Laminated sheets, which are formed of unidirectional orientated filament reinforced strips, are cut to a desired profile and folded into a three-dimensional composite. Since the fibers within a strip are unidirectional and the strips in the sheet are laid parallel to each other, the orientation and the geometry of the fibers are not adapted to three-dimensional shape. Therefore, it is not obvious from the disclosure of Cogburn et al. to back-calculate the fiber-orientation from the three-dimensional target shape.

Cavallaro et al. disclose an improved hockey stick comprising a dual-blade stick with blade reinforcing means. The blade comprises longitudinal fiber plies, transverse

plies, and angle plies, which are stacked together in a pre-calculated way. However, it is not disclosed that the fibers within a single ply are orientated in a pre-calculated way. Therewith, Cavallaro et al. fail to disclose that the fiber orientation in a single ply or a two-dimensional fabric is back-calculated from a three-dimensional target shape.

Marshall et al. describe the production of aeroelastically responsive composite propellers. Said propellers include plies having unidirectional oriented fibers. Said plies are laminated in crossplies so that the fiber orientation of neighbored plies is not identical. Marshall et al. do not give a hint on pre-calculating the fiber orientation within one ply by back-calculating from the final there-dimensional target shape.

Summarizing, each document cited by the Examiner describes the pre-calculation of the geometry of a two-dimensional bonded fabric or ply. However, each of the applied documents fails to disclose the feature that the fiber orientation within a two-dimensional fabric is back-calculated especially from a final three-dimensional target shape. Even if a person skilled in the art combines the teaching of Taggart et al. with one of the teachings of Wang, Williamson, and one of the teachings of Cogburn, Cavallaro, or Marshall, he would not result in a method according to present claim 1 as it is missing this key feature. Present claim 1 is therefore novel and non-obvious with regard to any reasonable combination of the applied references. Claims 2-9 depend from what is believed to be an allowable claim 1 and are believed to be allowable based, at least, upon this dependence.

Summary

As noted above claim 1, and the claims dependent therefrom, are believed to be allowable over the applied art of record. In view of the above, it is submitted that the application is in condition for allowance, and action towards that end is respectfully requested. Should the Examiner wish to modify the application in any way, applicant's attorney suggests a telephone interview in order to expedite the prosecution of the application.

Respectfully submitted,

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